



R E P O R T on Sanitary Matters
in the Districts of Grand Port
and Savanne.



By

ANDREW BALFOUR, C.B., C.M.G., M.D.

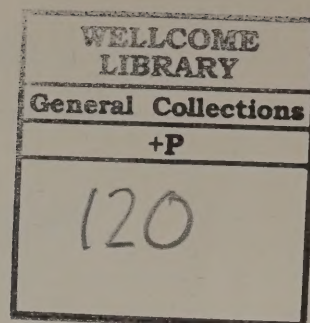
*Director - in - Chief of the Wellcome
Bureau of Scientific Research, London.*



Printed by authority of His Excellency the Governor :
P. G. Bumstead, Acting Government Printer, Mauritius.



22502706453



LIST OF CONTENTS

Introduction ...	...	...	...	...	1
Grand Port District ...	...	...	...	...	1
Mahebourg ...	...	...	...	...	1
Rose Belle... ..	...	...	...	...	3
New Grove and Plaine Magnien	...	...	...	...	4
Bel Air	...	...	...	...	4
Vieux Grand Port ...	...	...	...	...	4
Bois des Amourettes	...	...	...	...	5
Grand Sable	...	...	...	...	5
Escalier	...	...	...	...	5
Sugar Estates	...	...	...	...	5
Beau Vallon ...	...	...	...	...	6
Deux Bras	...	...	...	...	6
Riche-en-Eau ...	...	...	...	...	6
St. Hubert	...	...	...	...	6
Union Vale	...	...	...	...	7
Swamps, Pointe d'Esny	...	...	...	...	7
Savanne District	...	...	...	...	7
Souillac	...	...	...	...	7
Chemin Grenier	...	...	...	...	8
Baie du Cap	...	...	...	...	8
Rivière des Anguilles	...	...	...	...	8
Camp Diable	...	...	...	...	9
Sugar Estates	...	...	...	...	9
Britannia	...	...	...	...	9
St. Avoird	...	...	...	...	9
Bel Air—St. Félix	...	...	...	...	9
Rivière des Anguilles	...	...	...	...	9
St. Aubin	...	...	...	...	9
Swamps	...	...	...	...	9
General Considerations ...	...	...	...	...	10
Staff	...	...	...	...	10
Water Supplies	...	...	...	...	10
Conservancy	...	...	...	...	10
Sugar Estates	...	...	...	...	11
Summary of Recommendations	...	...	...	...	11

REPORT

ON SANITARY MATTERS IN THE DISTRICTS OF GRAND PORT AND SAVANNE.

THE HONOURABLE THE COLONIAL SECRETARY.

SIR,—I have the honour to submit a short report embodying the results of inspections made in the districts of Grand Port and Savanne.

It appears unnecessary to enter into minute details as was done in the case of the report dealing with the Beau Bassin—Curepipe area. Such a course would merely lead to a great deal of repetition as naturally many of the conditions obtaining in one part of the Island are reproduced in another locality.

Moreover matters requiring immediate attention have already formed the subject of communications, the subjoined memoranda having been submitted :—

No. 160/R/56	...	9.7.21	...	Drains, Mahebourg Hospital.
161/R/57	...	9.7.21	...	School, Mahebourg.
166	...	14.7.21	...	Fuming pits.
162/R/58	...	9.7.21	...	Well, L'Escalier School.
170/R/59	...	18.7.21	...	Drains, Mahebourg Hospital.
175/R/63	...	30.7.21	...	Well, Old Grand Port.

It was not, of course, feasible to inspect everything of sanitary and medical interest in these two districts but an effort was made to see as much as possible and to carry out judicious sampling in the case of sugar estates and schools. It may be noted that Kendrick places the percentage infection with ankylostomiasis in Grand Port at 86.8 and in Savanne at 80.1.

GRAND PORT DISTRICT.—POPULATION, 50,398.

The following inspections were made :—

Towns and Villages.—Mahebourg, Rose Belle, New Grove, Plaine Magnien, Escalier, Bel Air, Vieux Grand Port and Bois des Amourettes.

Sugar Estates.—Rose Belle, Beau Vallon, Deux Bras, Riche en Eau, St. Hubert and Union Vale.

Schools.—Girls' Government School, Boys' Government School, Girls' R. C. Aided School and Boys' R. C. Aided School, Mahebourg ; Two Government Schools, Rose Belle ; R. C. Aided School, Vieux Grand Port ; R. C. Aided School, Anse Jonchée ; R. C. Aided School, Grand Sable and Government School, L'Escalier.

Hospitals.—Government Hospital, Mahebourg and the Sugar Estates Hospitals.

Dispensaries.—New Grove, Bois des Amourettes.

Railway Stations and Camps.—Mahebourg and Rose Belle.

Special Water Supplies.—For Mahebourg from Cascade and Bee Varangue Rivers. The third source from Bee Manique was not seen (*vide infra*). For Rose Belle from the Citron River.

Engrais.—Beau Vallon and small Engrais on estates.

Cemeteries.—Parish Cemetery, Mahebourg, Pointe Brocus Government Cemetery.

Special Institutions.—Maize Sècherie, Mahebourg ; Biscuit Factory, Les Délices ; Church of England Orphanage, Rose Belle ; Rose Belle, Wireless Station ; Foundry, Rose Belle.

Various rivers, rivulets, canals, swampy areas and anti-malarial works were also inspected.

MAHEBOURG.—This old town which according to the latest census has a population of 6,402 was originally well planned and laid out and happily it has escaped the treatment which has been accorded to Port Louis, though, like the latter, it is very distinctly a place which has seen better days. Still

	there is very little overcrowding, there has not been much sub-letting of yards and other premisses, and slum areas are fortunately absent. The business part of the town is not extensive and on the whole was found to be kept in a fair sanitary condition. The state of the yards compared very favourably with those of Curepipe and elsewhere. Whether this was due to the fact that H. E. the Governor has recently been interesting himself specially in the sanitation of the town or whether there had been a special clean up in honour of my inspection, I cannot say, but I am inclined to think that the absence of dual control and the presence of a Sanitary Inspector who has a sound if limited, knowledge of his work and takes it seriously may have a good deal to do with it. There is no Local Board. The Sanitary staff working under the Medical and Health Department consists of one Sanitary Inspector, one Sanitary Guard, one Abattoir Inspector, one Market Inspector, one market guardian, one cemetery keeper and four rat-catchers.
Sanitary Staff.	
Prevailing diseases.	I was told, and an inspection of the records confirmed the statement, that the prevailing diseases were influenza, tuberculosis and malaria. Tuberculosis is no doubt favoured by the habit of closing all windows at night. Typhoid fever and dysentery are not common and cases of dysentery are said to have diminished since most of the shallow wells were closed.
Water Supply.	There is a piped <i>Water Supply</i>, the water being taken from three hill streams in the Cluny district, namely the Cascade River, the Bee Varangue River and the Bee Manique River, all of which traverse an uninhabited country so that there is little opportunity for fouling. The water is said to be of good quality but I would point out that the ponded water above the small dams on the Cascade and Bee Varangue Rivers is only a short distance from the Cluny Road and is not in any way protected. I did not visit the source of supply on the Bee Manique River but it is far from the road and very unlikely to become contaminated. It is true that in the past there has been no trouble but when one considers that there is no filtration plant the position and state of the intakes on the Cascade and Bee Varangue Rivers are certainly not wholly satisfactory. Either the supply should be drawn from spots much more remote from the road or a small chlorinating plant should be available, to be fixed just below the spot where the three pipes unite to form the main which carries the water to a service reservoir at New Grove or just below the reservoir itself. The first method has much to commend it for chemical sterilization is better avoided unless it is absolutely necessary. The area which the three streams traverse should not be leased for "chasse" purposes as thereby an element of possible danger is introduced.
Night Soil Service.	The <i>Night Soil Service</i> was, at the time of my visit, in the hands of a contractor. Four carts and 12 men were employed for the transport of 600 tubs, there being a daily service for government buildings and a tri-weekly service for the rest of the town. The place of disposal was an open engrais at Beau Vallon Estate which presented some of the worst features of these institutions and the pits of which were breeding huge numbers of <i>Culex</i> larvæ.
Scavenging Service.	In the <i>Scavenging Service</i>, which left much to be desired, 6 carts and 18 men were employed. There are 5 public latrines in Mahebourg averaging 3 receptacles each. These, and the private latrines generally, present the usual faults. At the time of writing the night soil service is in process of change, H. E. the Governor having taken the matter in hand and placed the new arrangements in charge of the Chief Sanitary Officer. The tubs are to be provided with covers and a trenching system is to replace the objectionable Engrais. Facilities for the proper cleansing of receptacles will be in force and a very radical and beneficial change should thus be effected. Still it is highly desirable to substitute proper metal pails for the wooden tubs.
Need for incinerators.	The town refuse is to be burned and a small destructor will be required if this is to be done efficiently and without creating a nuisance. It is possible that a number of small closed incinerators might serve the purpose. A cheap form of incinerator can be constructed from empty petrol tins or cresol drums filled with earth, wired together and provided with a fire-grate, ash-pit and chimney.
Railway Station.	Other points noted as regards Mahebourg may be summarised as follows :
Railway Camp.	The sanitary condition of the <i>Railway Station</i> is fair. The urinals were faulty. Sawdust urinals communicating with an absorption pit are required and the latrines should be altered on the lines suggested for stations generally. The <i>Railway Camp</i> though well situated is bad, consisting merely of back-to-back cubicles and without any windows. The latrine accommodation is quite inadequate. Flies were numerous. No back-to-back houses should be permitted in any part of Mauritius.

The *Market* is fairly satisfactory but the roof leaks and requires attention. Beef and fish are not sold in it. Market.

The *Slaughter House* is a very creditable place and is drained to the sea. Some cleaning up was required in the neighbourhood. Rather remarkable features are the deep covered pits for offal. They are well constructed, well managed and appear to give rise to very little nuisance, save possibly when they are emptied. Slaughter house

I was very glad to find in Mahebourg a small open air *Laundry*, the waste from which passes directly to the sea. Laundry.

There are two *Bake-houses*, neither of them satisfactory and both of which will have to conform to the new regulations. Bake-houses

The solitary *Aerated Water Factory* is fairly good. The proprietor agreed to get rid of a sand and charcoal filter which he was using and which was unnecessary and a possible source of contamination. Aerated Water Factory.

The *Manioc Biscuit Factory* is a primitive kind of place some distance from the town but there is no nuisance there. The deep pit latrine which serves the employees is distinctly better than any pail system could be. A cover should be provided for the opening. There seems no danger of the well being contaminated from the latrine pit. Biscuit Factory.

A *Swamp* at Ville Noire has been drained and no longer breeds mosquitoes but stegomyia larvæ were found in vases at the Parish Cemetery despite the presence of a notice regarding the use of sand. Cemetery.

At Pointe des Regates there is a nuisance owing to the improper use of rubbish for reclaiming low-lying land. This was pointed out to the Sanitary Warden.

Four *Schools* were inspected. In all, the latrines were very unsatisfactory, the buildings being either defective and unsuitable or the closets being in a filthy condition due, in part, as is always the case, to their faulty construction. In the case of the Boys' Government School the accommodation for pupils is inadequate while the premises of the Boys' R. C. Aided School were in such a disgraceful condition that it was felt necessary to submit a special memorandum regarding them. (My 161/R/57 of 9.7.21.) Schools.

The following Statistics regarding the Schools are of some interest :

Girls' Government School : Pupils on roll 183, Average attendance 145.
Boys' Government School : Pupils on roll 282, Average attendance 168.
Girls' R.C. Aided School : Pupils on roll 213, Average attendance 135.
Boys' R.C. Aided School : Pupils on roll 130, Average attendance 81.

The *Police Station* was found to be in a very cleanly condition but the kitchen required whitewashing. Police Station.

The *Hospital* will be considered in the medical report which will deal with hospitals and dispensaries. Here all that need be said is that the disposal of sullage water left much to be desired as pointed out in my No. 160/R/56 and 170/R/59 of 9.7.21 and 18.7.21.

ROSE BELLE.—This is a village of the usual type containing about 6,119 inhabitants. Rose Belle.

The *Sanitary Staff* consists of a Sanitary Inspector who has to look after a district 10 miles by 15 miles with a population of 26,000, one sanitary guard and five labourers who attend to rat-catching amongst other duties. The District Board supplies an Inspector and a sanitary guard who have no special training. Notes have been kept regarding all the places visited but here I would only mention that the Railway Camp is a place unfit for human habitation with dark, ill-ventilated, back-to-back dwellings recalling caves rather than houses for human beings, filthy latrines and a defective catch-pit for urine in which mosquito larvæ were swarming; that the latrines nearly everywhere are unsatisfactory and that flies abound. Sanitary Staff.

The main *Water Supply*, of good quality, is derived from Rivulet Casse Couteau, a feeder of the Citron River. The dam was visited. It is remote from any road and the only risk of contamination is from "chasse" parties. This element of danger should certainly be eliminated for there is no filtration plant. A subsidiary supply is obtained from the Mahebourg pipe line. Water Supply.

The *Night Soil Service* is carried out by a contractor who for 300 pails employs 2 carts and 6 men. The place of disposal is an open Engrais at Rose Belle Estate. There is a daily removal in the case of government buildings and the usual unsatisfactory tri-weekly removal elsewhere. Night soil service.

The *Scavenging Service* is stated to be well performed. One cart and 5 men are deemed adequate. Scavenging service.

The *Bake house*, in which fowls were found, required whitewashing. Bake house.

Slaughter house. The *Slaughter House*, is situated at the back of the main street and adjoins the house of the Police Inspector. It is a private abattoir and is rather a primitive place. The floor has recently been repaired. The sullage passes into a metal tank sunk in the ground whence it is baled out and dealt with by an absorption pit. The manure is simply thrown on the ground, covered with tree branches and removed once a month. Thus it becomes a fly nursery. It should be stacked and covered with a mixture of oil and earth.

Ruisseau Sec. The *Ruisseau Sec*, which traverses the village and is a tributary of the Rixer La Chaux was searched throughout part of its course for anopheline larvæ but none were found. In one small pool the larvæ of *C. tigripes* were present.

Schools. There are two *Government Schools*. That situated farthest up the hill has not sufficient accomodation and the latrines, which were not in a cleanly condition, are situated much too near the school building.

Orphanage. An *Orphanage* belonging to the Church of England was found in a good sanitary state save as regards the six latrine tubs provided for 46 children. These were not satisfactory and I was informed that the night-soil service was very badly performed. At the time of my visit there was a strike amongst the sweepers with results which can be imagined. Information was furnished as regards the small field type of smoke latrine which it may be possible to introduce here.

Generally speaking the sanitary condition of Rose Belle left much to be desired though the main street has excellent side gutters well paved and with a good fall. More efficient inspection is required together with the various measures detailed in my Beau Bassin—Curepipe report.

Prevalence of stegomyia. In the summer there is still a little malaria in this locality though a great deal has been done in the way of canalising the Ruisseau Sec. Prevention is now largely a question of minor works. I found stegomyia larvæ in several barrels. Ordinary anti-mosquito measures appeared to be rather in abeyance. They should be vigorously prosecuted. It was arranged that the Sanitary Inspector should supply gold fish (Madame Céré) for the barrels. This has been done.

Wireless station. *Wireless Station*.—This is well built and has been rendered mosquito proof while anti-malarial measures have been carried out with good results in the immediate neighbourhood. There is a small septic tank installation which is said to function well. The water supply is the same as that of Rose Belle.

Cemetery.—The absence of any burial ground imposes a hardship. A cemetery is required.

New Grove and Plaine Magnien. NEW GROVE AND PLAINE MAGNIEN.—There is little to note as regards these small villages. Most of the houses are of a poor type and many are smothered by trees and surrounded by sugar cane. The usual sanitary faults were everywhere apparent and have been noted for reference.

Laundry. There is quite a good *Public Laundry* at Plaine Magnien but it is not at present in use. Advantage should certainly be taken of it.

Prevalence of malaria at Plaine Magnien. Malaria is prevalent at Plaine Magnien in the summer and is to be attributed to anopheline nurseries formed by two large depressions in the soil where water collects after heavy rain. Representations have been made to get these hollows filled up as could easily be done but so far nothing has been accomplished. The matter should receive attention before the end of this year.

Bel Air. BEL AIR is a scattered hamlet which is also very much smothered in vegetation. Indeed I would strongly recommend that some clearance be effected in this locality for the Ruisseau des Délices has not been canalised in the part that courses past the back of the village and is in a state very favourable to anopheline breeding. The bush and trees afford shelter to mosquitoes. The lower part of the stream has been dealt with and is in a satisfactory condition but steps should at once be taken to deal with the portion near Bel Air. The cost will not be great and I understand the matter has already been discussed and that funds are available.

Vieux Grand Port. VIEUX GRAND PORT once had the reputation of being a very malarious place but I understand conditions have improved. There is little to be said regarding it for the houses, mostly fishermen's huts, are few and scattered. A supply of somewhat brackish water is obtained from a well which is covered and is provided with a properly affixed hand pump. Attention had to be drawn to a hole in the discharge pipe (My 176/R/63 of 30.7.21).

Water Supply. It is very necessary that the scheme for supplying Vieux Grand Port with pure water from the spring of Ruisseau Hollandais should be carried into effect.

The small *R. C. Aided School* here, with 98 pupils on the roll and an average attendance of 61, gets its water partly from the well and partly from a rivulet which is liable to contamination from people living higher up the hill though apparently no trouble has occurred. The single class room is badly lighted. There is no latrine provision of any kind. A properly constructed covered pit latrine is required. School.

At the Civil Status Office I ascertained that during June there had been three deaths from dysentery, one from enteritis and four from "fever." Influenza and pneumonia have recently been very prevalent in this district.

BOIS DES AMOURETTES is a straggling village consisting chiefly of fishermen's houses, some of which are of a fairly good type. The sanitary conditions are very primitive. There is a scheme for supplying water to Bois des Amourettes and the small villages of Treize Cantons and Belle Vue from two springs near the main road. This is certainly desirable. Bois des Amourettes.

THE ANSE JONCHÉE *R. C. Aided School* is in the neighbourhood. It has 91 pupils with an average attendance of 63. The school building is in bad repair and there is no latrine. A properly constructed covered pit latrine is required.* School.

GRAND SABLE is a small fishing village where everything is very primitive. The *R. C. Aided School* is in the Chapel and therefore well housed. It has 35 pupils on the roll with an average attendance of 20. There is a shallow pit latrine which, at the time of my visit, was full and in a disgusting state. Grand Sable. School.

ESCALIER.—This is a large village of some importance. It presented the usual features and sanitary defects which need not be detailed. The conditions at the *Police Station* presented a marked difference to those generally prevailing as indeed is to be expected. The *Water Supply* is obtained from wells. In this connection the recent occurrence of a case of dysentery and a case of typhoid fever in the house of the school master, which forms part of the premises of the large *Government School*, is disquieting. The well was found to be defective and liable to pollution and this matter has formed the subject of a special memorandum (My 162/R/58 of 9.7.21). The class room is badly lighted in parts and the school yard at the time of my visit was very dirty. Number of pupils on roll 270. Average attendance 180. I was told there was much illness due principally to malaria, dysentery and pneumonia. Escalier. Water Supply; School.

A scheme is on foot for introducing a piped water supply from the same source as furnishes Rose Belle. It is to be hoped that this will be carried out at an early date in view of the prevalence of dysentery, which in Escalier, is almost certainly water-borne. This supply would also serve Union Vale, Beau Fond, Malakoff and La Baraque. New water supply.

Cemetery.—This populous neighbourhood has no burial ground. One is certainly required.

SUGAR ESTATES.—There is a great similarity about the camp lines and the hospitals in the case of all the estates visited. In my Beau Bassin—Curepipe Report I have commented on the type of dwelling for coolies. It would undoubtedly be an advantage if the houses were raised on supports above the level of the ground. It would also be well if some means could be found whereby ventilation openings which could not be blocked up at night could be introduced. I fear this can only be accomplished by so-called ridge ventilation in the roof. In some of the camps, windows are provided but it appears they are always fastened up at night and there can be no doubt that the atmosphere thus produced has much to do with the great prevalence of pulmonary tuberculosis, pneumonia and other respiratory complaints. Sugar Estates. Camp lines. Ventilation.

It seems that barracks for single men were prohibited by law owing to the occurrence of thefts in them. It would be an economy and advantage if they could be reintroduced, provided a good type of buildings was erected. If this were done it would be possible to have hammock beds of the type supplied the boys in the Reformatory, Rose Hill, or plank beds with one end resting on a ledge in the wall and the other placed on railway metals set upright in the ground and bent over at the top. This is a common type of labourers' bed in Natal and answers well. There can be no doubt that cultivation of any kind should be prohibited within the camp area and for a certain distance around it. I am aware that the Indian likes to have his plot Clearance.

* I propose in my next report to give an account of how this can best be done.

of garden close to his house and that it would not be an easy matter to carry out the desideratum I have mentioned, but at Rivière des Anguilles Estate, Savanne, I found a camp almost free of vegetation and cultivation and the advantages were at once obvious. The Manager told me he had experienced some difficulty in effecting the clearance but the fact remains that the thing had been done, so it is not impossible.

Water Supplies.

It is important in all cases to provide a good piped water supply if it can possibly be obtained even though the coolie may sometimes desert it for his beloved but polluted canal or stream. The fact that he does so is no excuse for letting him run risks and it must be remembered that every case of dysentery or typhoid fever forms a fresh focus of infection.

If cholera ever gained a footing in Mauritius the toll on the sugar estate employees would in many cases be terrible. Fortunately some of the estates have provided pure water even at considerable expense. It will pay them in the long run.

Latrines.

The latrines of course, are quite unsuitable. It is no wonder they are little used. In some camps they are fairly well looked after and in others they are disgusting places. I am glad to say that several of the Estates have agreed to give a trial to the "fuming pit" system and to report upon its suitability or otherwise.

Estate Hospitals.

The Estate Hospitals varied: Some were good, some bad, some indifferent. One thing they all possessed in common, a great lack of comfort. There was nothing to brighten up the wards which are dreary places for sick folk. It would be a mistake to make the hospitals too comfortable, but surely a little might be done to make the wards less repellent! a few pictures on the walls, a few flowers here and there would cost little and make a considerable difference. I know the Indian in his own country and he appreciates such things while a patient has a mind as well as a body. Each hospital dispensary should have a separate cupboard for poisons in which only poisons should be kept. This is a well known rule for all pharmacies but nowhere did I find it in force. Every hospital should be provided with a small incinerator to burn dressings, litter, &c., and in each there should be facilities for washing clothes and bedding.

I would now consider a few of the salient features of the individual estates.

Beau Vallon Estate.

BEAU VALLON ESTATE.—Its salient feature is the prevalence of swine. Instead of being kept in a special enclosure, as is the rule elsewhere, they are permitted to roam about the camp in hundreds. There are stated to be approximately 3,000 of them even though their numbers have been greatly reduced. They act as scavengers but at the same time bestrew the whole area with their excrement. Indeed Beau Vallon Camp is a disgraceful place and its condition should not be tolerated. It is littered both with pig and human excrement. It should undoubtedly be declared a nuisance and that nuisance should be suppressed. In every respect this camp was found to be most insanitary. The attention of the Honourable Protector of Immigrants should certainly be directed to the matter. The hospital is a cheerless place where more than 100 cases of dysentery are treated in the year. There is much malaria and the kitchen is close to the latrine. The latter is filthy and there is a pigsty in the hospital yard.

"Piggery" would certainly be a more appropriate name for this camp than Beau Vallon.

Deux Bras Estate

DEUX BRAS ESTATE.—Here some of the camp lines are fairly good but the place is much overgrown. The hospital is well built and is clean. Flies were, however, numerous, doubtless coming from the adjacent lines.

Riche en Eau Estate.

RICHE EN EAU ESTATE.—Here it was interesting to find a crèche which appeared to be well managed and which is a very useful institution. The smaller children were, however, unable to use the latrine and hence there was some fouling of the ground. A suggestion was made which, if adopted, will remedy this nuisance and danger to health. The hospital was of a bad type there being back-to-back wards. The Manager agreed to cut arches in the partition. This should have the effect of improving the ventilation.

Creche.

St. Hubert Estate.

ST. HUBERT ESTATE.—There has been very energetic anti-malarial work in connection with this estate and moustiquiers are paid by the estate for the upkeep of the anti-malarial operations. The banks of the large Rivière des Créoles are kept in excellent condition. There is a piped water supply. At one place the pipe was leaking badly and causing a nuisance. Attention was directed to the defect. The hospital is of a fairly good type. There is still a considerable amount of malaria but cases have greatly decreased since the anti-malarial measures were completed. There is an excellent cattle stable which might well serve as a model to other places.

UNION VALE ESTATE.—There is nothing special to note. The hospital has a wooden floor. Cement concrete is preferable. Union Vale estate.

Mention may be made of Dr. Castel's work in connection with the swamps at Pointe D'Esny. Much has already been accomplished and when the operations are completed they should go a long way towards diminishing malaria in this locality. The problem was not an easy one, but appears to have been surmounted by a combined method of filling and draining, thanks to the fact that a large pool into which the water can be led has a subterranean connection with the sea. An inland swamp, the Mare aux Mulets, has not yet received attention. Swamps at Pointe d'Esny.

SAVANNE DISTRICT.—POPULATION, 32,785.

Savanne district.

The inspections comprised the following:—

Towns and Villages.—Souillac, Chemin Grenier, Baie du Cap, Rivière des Anguilles, Camp Diable.

Sugar Estates.—Britannia, St. Avold, Bel Air, St. Félix, Rivière des Anguilles, St. Aubin.

Schools.—Government School, R. C. Aided School, Souillac; R. C. Aided School, Chemin Grenier; Government School, Rivière des Anguilles; Government School, Camp Diable.

Hospitals.—Government Hospital, Souillac and the Sugar Estates Hospitals.

Dispensaries.—Chemin Grenier, Rivière des Anguilles.

Railway Stations and Camps.—Souillac, Rivière des Anguilles.

Special Water Supply.—For Souillac from the River Savanne, above the Cascade Cecile.

Engrais.—Riambel and small Engrais on Estates.

Cemeteries.—Souillac and Camp Diable.

Special Institutions.—Engineering Workshops, Rivière des Anguilles; Infirmary, Chemin Grenier; Orphanage in course of erection, Camp Diable.

Various rivers, rivulets, canals, swampy areas and anti-malarial works were also inspected.

SOUILLAC.—This is a picturesque place of 1,550 inhabitants and has the reputation of being very malarious in the summer. It would appear that this is largely due to the fact that it is low-lying and that, after heavy rain, pools form which remain long enough to permit anophelines to breed out. A small rivulet also provides breeding places. It could without much expense be put in order and this should be done before next summer. A valley on the Terracine Estate, through which the Savanne River courses, requires urgent attention, especially in the vicinity of the Rochester Falls.

Souillac.

The District Board of Savanne is concerned only with water supply and the upkeep of roads.

The Sanitary Staff, working under the Medical and Health Department, consists of the Sanitary Inspector, who takes a great interest in his work and is diligent in the prosecution of his duties, two Sanitary Guards, one rat-catcher who has charge of the plague lazarette, four labourers and one "moustiquier" for minor anti-malarial works. The Sanitary office in Souillac is the only one where I found a book dealing especially with anti-malarial measures. It had been purchased by the sanitary inspector himself.

Sanitary Staff.

The general sanitary condition of Souillac is fair, such nuisances as exist being due to faulty methods or construction rather than neglect. The *Railway Station* was found in a cleanly condition though a urine-pit was not properly covered. A pit under a signal lever was found not to be mosquito-proof. After rain, water collects in it and larvæ can be found. The *Police Station* was not up to the usual standard, so far as sanitation is concerned, but representations had been made regarding it. The main gutter in Royal Street—an earthen drain—was in bad condition and required attention.

Railway Station.

Police Station.

Water Supply.—A special visit was paid to the somewhat inaccessible stretch of the Savanne River above Cascade Cecile, the pipe line being traced to the intake. It is only recently that the river has been tapped so high up and the risk of pollution is now infinitesimal.

Water supply.

Souillac is fortunate in possessing such a good and plentiful supply of water. There seems no need for any artificial purification.

The *Public Latrines* were of the usual bad type but, at the time of my visit, were not unclean. The *Night-Soil Service* which handles 280 tubs is carried out by one cart and 4 men. The place of disposal is the *Riambel Engrais* which I visited. The best thing about it is that it is remote from

Public latrines,
Night-soil
Service.

any human habitation. Town refuse is not taken to the engrais. The *Scavenging Service* at the time of my visit deposited and burned all street sweepings at a spot near the Court House. The Magistrate complained to me of the nuisance thereby created. An incinerator is badly needed. For refuse collection and disposal 3 carts, 4 men and 5 sweepers are employed.

Slaughter house. The *Slaughter House* is a good building but the flooring required repair. It is drained into the sea partly by a pipe, partly by an open channel. The condition of both is very bad. The pipe is broken in several places. Dry manure is pitted and removed once a week by a contractor. There does not appear to be much local nuisance from this practice as the removal is so frequent that few flies breed out.

Plague lazarette. The *Plague Lazarette* has been allowed to fall into a very bad state of repair. As it might be required at any time it should be taken in hand and restored without delay.

Prevention as regards plague. My intention was directed to the small vessels at the wharf. As these come from Port Louis anti-plague precautions should be taken regarding them on the lines mentioned in my "Report on Communicable Diseases."

Cemetery. The *Cemetery* presented no mosquito nuisance, flower vases not being in use.

Schools. *Schools.*—The *Government School* has 220 pupils on the register and an average attendance of 168. The chief causes of absence were stated to be poverty, influenza and malaria. Dr. Kendrick found 50 per cent. of the children in this school infected with ankylostomes. The supply of quinine is irregular. The school building has been attacked by white ants and requires attention. The latrines were unsatisfactory, a new one not being ventilated in any way. *R. C. Aided School.*—Pupils on roll 103. Average attendance 63. Same causes of absence. Supply of quinine irregular. Latrines of a fairly good type and steps provided so that small children could reach the seats. Cresol drums used instead of wooden tubs.

The *Government Hospital* will be considered in a separate report.

Chemin Grenier. CHEMIN GRENIER.—This village was found to present the usual sanitary or rather insanitary features. It is what is called a "proclaimed" village and hence possesses a *Night Soil Service*, one cart and 3 men being employed in the daily or tri-weekly removal of 280 tubs. The *Water Supply* is derived from a local spring. The *R. C. Aided School* has 193 pupils on the roll and an average attendance of 142. The latrines there are of the "squatting" type and well constructed of cement concrete. The *Government School* was closed at the time of my visit so I was only able to note that the building was not weather-proof and was unsuitable and that there were two latrines of the customary type. The village contains a *Dispensary* and an *Infirmery* for aged people. Both these institutions will be considered in a special medical report.

Baie du Cap BAIE DU CAP.—This is a small and scattered place. I would only note that here in July I found anopheline larvæ in pools close to the foreshore.

Rivière des Anguilles. RIVIÈRE DES ANGUILLES.—This is a large and rather important inland village which I found fairly clean. There is a contractor for the *Night Soil* and *Scavenging Services*, the former employing 1 cart and 4 men for the removal of 210 tubs, the latter being served by 1 cart, 4 men and 4 sweepers. The place of disposal, both for pail contents and refuse, is the closed Engrais at Rivière des Anguilles Estate. As engrais go it is a good type with a stone platform in front of it. It was gratifying to see that the tubs possessed covers. The *Water Supply* is derived from the Rivière des Anguilles, is conveyed in pipes and is satisfactory. *Railway Station* fair. *Railway Camp* better than usual, there being good rooms furnished with windows. The gutter in the main road is in bad condition. The stones for its repair have been lying at the station for several months! The *Gros Ruisseau* traverses the lower part of the village. It has been well canalised for about 1,200 yards above and below the bridge but lower down on the Rivière des Anguilles Estate it is overgrown and a possible source of anophelines. The solitary *Bakery* is of rather a primitive type with a faulty and dirty floor. There is a sleeping room communicating with the bakehouse.

The *Mauritius Engineering Workshops* employ about 500 men. The latrine accommodation was inadequate and the closets and their surroundings filthy in the extreme. There is frequent trouble from stagnant water in portions of the machinery lying about the yards.

School. *Government School.*—Pupils on roll 458. Average attendance 269. Absences due chiefly to poverty and illness. The building is of a good type but the same cannot be said of the latrines. The supply of quinine is regular and the drug is properly distributed. There is a *Dispensary* which will not here be considered.

CAMP DIABLE.—This is also a large village. The chief point to note is the need for a better and purer water supply than is to be obtained from the local wells. I understand it is intended to furnish a piped supply from the tributary of River Citron from which Rose Belle draws its water. The village is smothered in vegetation and there is far too much cane cultivation in close proximity to it. *Government School*. Pupils on roll 232. Average attendance 181. Building overcrowded and light bad. Water supply from a well 30 feet deep not properly steined and liable to contamination from the bare feet of persons drawing water. Three latrines seats of the usual type. An *Orphanage* is being built by a charitable Mahomedan. It promises to be a good building with excellent sanitary conditions. A plan has been furnished the architect, showing him how a well should be constructed and protected from any possible source of contamination. The *Cemetery* was found to be untidy but it presented no nuisance of any kind. Camp Diable.

SUGAR ESTATES.—Generally speaking the remarks made as regards the estates in Grand Port apply with equal force to those in Savanne save that, as already stated, the Rivière des Anguilles Estate furnished an example of what can be done in the way of keeping camp lines free from vegetation. The following points may be noted :— Sugar Estates.

BRITANNIA ESTATE.—Camp and lines generally untidy and overgrown with vegetation. One of the features of this estate is the presence of canals conveying water to it and other estates. Thus there is a canal from Rivière Dragon supplying Bel Air, St Félix, Colmar and Benares Estates. The water is polluted above the dam by St Avold Camp where cases of typhoid fever have been numerous. Another canal comes from the Rivière des Anguilles and supplies Britannia, Bel Air, St Félix, Colmar and Benares. The drainage of cows-sheds find its way into this aqueduct. The present state of affairs is bad and hence it is gratifying to note that a good piped supply from the Rivière des Anguilles, at present laid on to the houses of the Manager, Overseers, Office staff, &c., is to be extended to the camp. The coolie will of course always drink the water which is most convenient without considering its quality but if a good supply be provided the responsibility rests with the user. In the *Hospital* a case of typhoid fever was being treated and I was told that dysentery was common. Britannia Estate.

ST. AVOLD ESTATE.—The conditions resemble those at Britannia. Here also there was a case of typhoid fever. St. Avold Estate.

BEL AIR-ST. FELIX ESTATES.—Here for the first time I encountered uncovered latrines. It appears that these are sanctioned by Regulation No. 30 of 1914, doubtless in accordance with the old idea that the sun can sterilize excreta. This is quite erroneous and, in addition, it is in latrines to which the sun gains access that flies abound. Moreover after heavy rain the condition of roofless latrines may easily be imagined. All latrine buildings should be properly covered. The *Hospital latrines* here were good. Two springs furnish a fairly satisfactory *water supply*. Bel Air-St. Félix Estate.

RIVIÈRE DES ANGUILLES ESTATE.—This proved to be in every respect one of the best visited in the two districts. The *Hospital* is of a good type and very clean. The *water supply* is the same as that of the village. Rivière des Anguilles Estate.

ST. AUBIN ESTATE.—Here it was interesting to find a new type of coolie hut with walls of ravenal boarding and roofs of poilite. The houses appeared comfortable. Poilite was adopted to diminish the risk of fire but it is good from a sanitary standpoint and a poilite roof can be arranged to furnish ridge ventilation. The latrines in this estate are uncovered. Considerable anti-malarial work has been conducted by the estate with good results. The *Hospital* was, on the whole, satisfactory. The *water supply* is derived from a canal liable to pollution. St. Aubin Estate.

SWAMPS.—It is necessary to mention the marshes which are found at a short distance from the sea along the greater part of the coast of Savanne and more especially between Jacotet Bay and Baie du Cap. They are of a similar nature to those at Pointe d'Esny in Grand Port and are a source of malaria in the summer. Unfortunately they cannot be so easily dealt with as the Pointe d'Esny marshes for there is no connection with the sea and the ridge which separates the latter from the swamps has a considerable elevation. The filling up of such an extensive area is out of the question; drainage, save possibly in certain areas, is not feasible, pumping would be very expensive and, so far as I can see, the only things to be done are to deal with the swamp vegetation, to oil systematically, to stock with fish and to try the effect of sunflower cultivation. The sunflower is a valuable plant, will grow Swamps.
Sunflower cultivation.

in certain kinds of marsh land, absorbs water in a high degree and requires little care in cultivation. It has been used with some measure of success in the Mississippi Valley and the de Kaap Valley in the Transvaal. The best seed used to be obtainable from Austria and Southern Russia. Possibly a supply might be obtained from South Africa. Sufficient might be got for experimental trial under the guidance of the Director of Agriculture.

GENERAL CONSIDERATIONS

General
considerations.
Staff.

1. STAFF.—The latest census figures, kindly supplied me by Mr. Walter, show that Grand Port District has a population of 50,398 and the District of Savanne one of 32,785. Yet both these Districts, as well as the populous District of Plaines Wilhems, are under the charge of a single Sanitary Warden.

Medical Officer of
Health.

It is obviously quite impossible for him to carry out his duties in a satisfactory manner. I would therefore recommend that there be one Sanitary Warden or, as I would prefer to call him, one Medical Officer of Health, for Grand Port and Savanne. It is advisable that he should reside in his district, say at Mahebourg or Rose Belle. Souillac would also be suitable as headquarters.

If the suggestions put forward in my Beau Bassin-Curepipe Report be accepted the present Sanitary Warden for the three districts may be available for the two now under discussion and his knowledge of the areas will be useful.

Sanitary
Inspectors.

He must, however, be given greater assistance in the way of Sanitary Inspectors. In my opinion there should be three in Grand Port i.e. one at Mahebourg, one at Rose Belle and one at Escalier, while Savanne requires two, one at Souillac and one at Chemin Grenier. In addition to providing for much more intensive work such an arrangement will enable measures to be taken, in case of sickness and leave without depleting other districts. These Sanitary Inspectors should serve only the Medical and Health Department.

Sanitary Guards.

I cannot say I have been impressed with the work of the so-called "Sanitary Guards" but they are scarcely to blame for they receive little training and very little encouragement, their pay being only Rs. 40 per month including war allowance. If their knowledge and status can be improved I feel that an addition to their numbers might also, with advantage be made in these two districts. A question of great importance is the mobility of Sanitary Inspectors. They can go by train to certain places but others are far from the railway and in any case trains are few and far between. At present a Sanitary Inspector receives the sum of Rs. 58.33 per month for carriage hire and he usually possesses a bicycle of his own. The small travelling allowance is very little help for one has now to pay Rs. 10 or 12 per diem for a carriage and it should either be increased or the inspector, if he is prepared to ride one, should be given a motor bicycle. Mobility pays in sanitation just as it pays in war and one of the chief complaints Sanitary Inspectors have made to me is the difficulty of getting about their districts. By limiting their range, as above suggested, restricting their duties and improving their facilities for travel a great impetus will be given to sanitary work.

A mobile force.

Water supplies.

2. WATER SUPPLIES.—I have been impressed by the trouble which has been taken to secure good water supplies for the larger towns and villages. Some of the latter, however, still suffer from having to rely on well water, doubtful springs or the water of unprotected streams. It is important to remedy this state of matters more especially in the case of Bel Air, Vieux Grand Port, Bois des Amourettes and Escalier in Grand Port and of Camp Diable and Chemin Grenier in Savanne. The scheme now under consideration have been mentioned. Adequate protection of "catchment areas" is also of great importance and has formed the subject of a special minute. (My 193/R/70 of 9.8.21). The question of water supplies to sugar estates merits, I think, an enquiry by the Protector of Immigrants.

Conservancy

3. CONSERVANCY.—It is clear that the question of night-soil and refuse disposal in rural districts must be very difficult. Hitherto that difficulty has in some measure been partly solved by the readiness with which sugar estates accept human manure and village sweepings for their Engrais. We have noted, however, that the Engrais, as at present managed, is a source of danger to the community (Report on the Sanitation of Beau Bassin-Curepipe) and yet it is not easy to see how it can be replaced. In the case of small towns such as Mahebourg, Rose Belle and Souillac where there is a Sanitary Inspector to keep an eye on things and where sufficient labour is forthcoming recourse can no doubt be had to trenching but it must be remembered that

trenching, badly carried out, creates a very serious nuisance and in some ways is worse than a closed Engrais. It is very unlikely to be a success for the smaller villages. Incineration might be tried but here again adequate supervision is most essential and how often will it be forthcoming?

A solution may perhaps be found in the use of what may be called a "smoke engrais." I have in mind a building of a closed type with a single opening in the roof through which pail contents can be introduced into the masonry tanks of the usual type or, where there is no risk of fouling water supplies, into pits with earthen sides. Existing Engrais could easily be adapted, and alongside and communicating with each, would be a fire-pit while a ventilating pipe would be affixed. Part of the street refuse, sweepings, &c, would, as at present, be added to the night soil and part would be burned to produce a smoke acting as a deterrent to flies. One attendant would look after the fire. When the tanks or pits were full their contents should be removed and buried, or, if dry enough, burned. Facilities should be provided for cleaning the pails before their return to the latrines. If washing is impossible they could at least be dipped in tar. Wooden tubs should gradually be superseded by proper metal sanitary pails. If possible contractors should be avoided and the work done by the Sanitary Authority, a conservancy rate being levied on those concerned. In the case of the very poor there would be no charge. It is of course only proclaimed villages which possess a pail system, a doubtful privilege. In other villages there is either no system at all or a privy pit is employed. Provided the latter is properly constructed and there is no risk of polluting a water supply, the privy pit may be far less a nuisance and a danger than a pail latrine. The great thing is to have it as dark as possible in order to keep flies away and to furnish the seat above it with a self-closing lid. When it is full the contents can be removed and buried or a new pit can be dug but this is difficult if a latrine building has been erected over it for the owner will rarely take the trouble to pull down and re-erect the structure. Everything depends on frequent and efficient inspection combined with instruction and school education in the principles of sanitation. (In a later report I describe a Concrete Vault Sanitary Privy which possesses many advantages).

A "smoke engrais."

Use of privy pits.

4. SUGAR ESTATES.—I am glad to say that several of the estates are giving a trial to the "fuming pit" latrine system. If it is a success I think it should be adopted except in places where the soil is quite unsuitable, if any such exists and the subsoil water is too high or there is risk of contaminating water supplies. I am of opinion that each Estate Hospital should be provided with a small laundry and with a closed incinerator for burning old dressings, refuse, yard litter and also, if required, infected stools.

Sugar Estates.

It is unfortunately true that while one estate carries out its duties efficiently as regards anti-malarial measures, another may be remiss or entirely neglectful. Pressure should be brought to bear upon Estates which do not fulfil their obligations in this respect.

SUMMARY OF MORE IMPORTANT RECOMMENDATIONS

1. Provision of a Sanitary Warden, better termed a Medical Officer of Health, for the two districts of Grand Port and Savanne. These to be his sole care. (For complete scheme see the forthcoming Medical Report).

2. Sanitary Inspectors of Grand Port to be increased from 2 to 3 and of Savanne from 1 to 2.

3. Mobility of Sanitary Inspectors to be increased either by the provision of motor bicycles or an increase in travelling allowance. Their duties to be limited to those in connection with the Medical and Health Department.

4. The question of increasing the number of Sanitary Guards to be considered if their general usefulness can be enhanced by proper training and better prospects.

5. Catchment areas of certain water supplies to be more adequately protected.

6. Two of the three water-supply intakes for Mahebourg to be altered. If this cannot be done a chlorinating plant to be installed on the main.

7. More attention to be paid to the breeding places of "domestic" mosquitoes. Sanitary Inspectors to provide suitable fish for tanks and barrels, or, failing this measure, all water receptacles to be covered and the covers kept in good repair.

8. Sugar Estates should be required to furnish good water to their camp lines.

9. The schemes already prepared for supplying certain villages with pure water to be carried into effect as quickly as possible.

10. Piped water supplies for Camp Diable, Chemin Grenier, Vieux Grand Port, Escalier, and Bois des Amourettes to be obtained at an early date.

11. The Ruisseau des Délices to be canalised in the vicinity of Bel Air.

12. The Gros Ruisseau to be canalised below the village of Rivière des Anguilles.

13. Necessary anti-malarial works to be carried out at Plaine Magnien and in the lower part of the valley of the River Savanne.

14. Coastal swamps of Savanne to be taken in hand and the cultivation of sunflower tried.

15. Clearance of excessive vegetation, including sugar cane, in Plaine Magnien and Bel Air.

16. Estate camps to be cleared of vegetation and undergrowth. Those estates negligent as regards anti-malarial work to be reminded of their obligations in this respect.

17. Special attention to be directed to the insanitary conditions obtaining at Beau Vallon.

18. Estate hospitals to be improved by making the wards less dismal; the provision of small incinerators and laundry facilities.

19. Hospital dispensaries to have cupboards reserved solely for poisons.

20. Incinerators of a simple type to be provided for refuse disposal at Mahebourg now the trenching system for night-soil is in force.

21. Latrine accommodation, to be provided in the R. C. Aided Schools at Vieux Grand Port and Anse Jonchée.*

22. Latrines to be improved at the Mauritius Engineering Works, Rivière des Anguilles.

23. No uncovered latrines to be permitted on sugar estates. Regulation No. 30 of 1914 to be rescinded in this respect.

24. Repairs to be effected at slaughter-house, Souillac.

25. Plague lazarette, Souillac, to be restored.

26. Plague precautions to be taken in the case of small vessels at the wharf, Souillac, so long as plague rats are found in Port Louis.

27. Cemeteries to be provided at Rose Belle and Escalier.

I have the honour to be,

Sir,

Your obedient servant,

ANDREW BALFOUR.

* For account of special type of "privy vault" see Report on Rivière du Rempart and Flacq.

